

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before the Board of Patent Appeals and Interferences

Atty Dkt. SCS-124-1142

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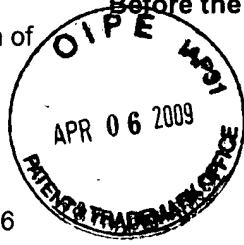
Confirmation No. 1938

TC/A.U.: 2884

Examiner: C. Iggyarto

Date: April 6, 2009

Title: THERMAL DETECTOR

**Mail Stop Appeal Brief - Patents**

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

 **Correspondence Address Indication Form Attached.** **NOTICE OF APPEAL**

Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the Examiner twice/finally rejecting \$540.00 (1401)/\$270.00 (2401) \$ applicant's claim(s).

An appeal **BRIEF** is attached in the pending appeal of the above-identified application \$540.00 (1402)/\$270.00 (2402) \$ 540.00

Credit for fees paid in prior appeal without decision on merits -\$ ( )

A reply brief is attached. (no fee)

Petition is hereby made to extend the current due date so as to cover the filing date of this paper and attachment(s)

One Month Extension	\$130.00 (1251)/\$65.00 (2251)
Two Month Extensions	\$490.00 (1252)/\$245.00 (2252)
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"Small entity" statement attached.

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**TOTAL FEE ENCLOSED** \$ 540.00 **CREDIT CARD PAYMENT FORM ATTACHED.**

Any future submission requiring an extension of time is hereby stated to include a petition for such time extension. The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our **Account No. 14-1140**.

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Signature:

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Patent Application of

Confirmation No.: 2884

COMBES et al

Atty. Ref.: 124-1142

Serial No. 10/563,056

Group: 2884

Filed: January 3, 2006

Examiner: C. Iggyarto

For: THERMAL DETECTOR

\* \* \* \* \*

**APPEAL BRIEF**

On Appeal From Group Art Unit 2884

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\* \* \* \* \*

April 6, 2009

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**APPEAL BRIEF**

Sir:

**I. REAL PARTY IN INTEREST**

The real party in interest in the above-identified appeal is QinetiQ Limited by virtue of an assignment of rights from the inventors to QinetiQ Limited recorded January 3, 2006 at Reel 17479, Frame 98.

**II. RELATED APPEALS AND INTERFERENCES**

There are believed to be no related appeals, interferences or judicial proceedings with respect to the present application, other than the Pre-Appeal Brief Request for Review previously filed in this appeal on January 21, 2009.

**III. STATUS OF CLAIMS**

Claims 1-23 stand rejected under 35 USC §112 (first paragraph), and based upon this rejection, the drawings are objected to in the official action. Claims 1-4, 8-17 and 19-23 stand rejected as either anticipated under 35 USC §102 or obvious under 35 USC §103 over Vig (U.S. Patent 5,686,779). Claim 5 stands rejected under §103 as obvious over Vig, McGlade (U.S. Patent 4,806,760) and Biernacki (U.S. Patent 6,236,145). Claim 6 stands rejected under 35 USC §103 over Vig in view of Ishizuya (U.S. Publication 2002/0036265). Claim 7 stands rejected under 35 USC §103 as unpatentable over Vig in view of Paros (U.S. Patent 4,459,042). Claim 18 stands rejected under §103 over Vig in view of McGlade. The above rejections of claims 1-23 are appealed.

**IV. STATUS OF AMENDMENTS**

No further response has been submitted with respect to the Final Official Action in this application other than the filing of a Pre-Appeal Brief Request for Review which decision was mailed March 5, 2009.

**V. SUMMARY OF THE CLAIMED SUBJECT MATTER**

Appellants' specification and figures provide an explanation of the claimed invention set out in independent claim 1, with each claimed structure addressed as to its location in the specification and in the figures.

“1. A device for detecting infrared radiation [pixel 30 as shown in Figure 3 and discussed on page 13, lines 1-7 and elsewhere in the specification] comprising:

a resonator element [resonator beam 36 as shown in Figure 3 and discussed on page 13, lines 1-7 and elsewhere in the specification] fixably attached to a supporting frame [suspended portion 32 as shown in Figure 3 and discussed on page 13, lines 1-7 and elsewhere in the specification];

an electrical oscillator [in Figure 4 as discussed on page 7, lines 25-32 and page 16, lines 25-30 and elsewhere in the specification] for driving said resonator element [36] into resonance, wherein the supporting frame [32] is adapted to absorb infrared radiation received by the device thereby altering a resonant property of said resonator element [as discussed on page 3, lines 9-18 and elsewhere in the specification]; and

mounting means [legs 43 in Figure 3 as discussed on page 13, lines 6-7 and elsewhere in the specification] for mounting said supporting frame [32] on a substrate [substrate 40 as shown in Figure 3 and discussed on page 13, lines 1-7 and elsewhere in the specification] and for providing thermal isolation between said substrate [40] and said supporting frame [32].”

**VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

Claims 1-23 stand rejected under 35 USC §112 (first paragraph) and based upon this rejection, the drawings are objected to by the Examiner.

Claims 1-4, 8-14, 16, 17, 19, 20 and 23 (as well as claims 15, 21 and 22) stand rejected as either anticipated under 35 USC §102 or obvious under 35 USC §103 over Vig (U.S. Patent 5,686,779).

Claim 5 stands rejected under §103 as obvious over Vig, McGlade (U.S. Patent 4,806,760) and Biernacki (U.S. Patent 6,236,145).

Claim 6 stands rejected under 35 USC §103 over Vig in view of Ishizuya (U.S. Publication 2002/0036265).

Claim 7 stands rejected under 35 USC §103 as unpatentable over Vig in view of Paros (U.S. Patent 4,459,042).

Claim 18 stands rejected under §103 over Vig in view of McGlade.

**VII. ARGUMENT**

Appellants' arguments include the fact that the burden is on the Examiner to first and foremost properly construe the language of the claims to determine what structure and/or method steps are covered by that claim. After proper construction of the claim language, the burden is also on the Examiner to demonstrate where a single reference (in the case of anticipation) or a plurality of

references (in the case of an obviousness rejection) teaches each of the structures recited in independent claim 1.

The Court of Appeals for the Federal Circuit has noted in the case of *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick*, 221 USPQ 481, 485 (Fed. Cir. 1984) that "[a]nticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim."

Furthermore, the Court of Appeals for the Federal Circuit has stated in the case of *In re Rouffet*, 47 USPQ2d 1453, 1458 (Fed. Cir. 1998)

to prevent the use of hindsight based on the invention to defeat patentability of the invention, this court **requires** the examiner to show a **motivation** to combine the references that create the case of obviousness. In other words, the Examiner **must show reasons** that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed. (Emphasis added).

In its recent decision, the U.S. Supreme Court in *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (April 2007), held that it is often necessary for a court to look to interrelated teachings of multiple patents, the effects of demands known to the design community or present in the marketplace and the background knowledge possessed by a person of ordinary skill in the art in order to determine whether there was an apparent reason to combine the known elements in the

fashion claimed by the patent at issue. The Supreme Court held that “[t]o facilitate review, this analysis should be made explicit.” *Id.* at 1396.

The Supreme Court in its *KSR* decision went on to say that it followed the Court of Appeals for the Federal Circuit’s advice that “rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness” (the Supreme Court quoting from the Court of Appeals for the Federal Circuit in *In re Kahn*, 78 USPQ2d 1329 (Fed. Cir. 2006)).

**A. The Examiner fails to properly construe claims 1-23 in accordance with 35 USC §112 (6<sup>th</sup> ¶) and erroneously concludes that the claimed “mounting means” is not disclosed in the drawings or described in the specification**

On pages 2 and 3 and sections 3 and 5 of the Final Rejection, the Examiner alleges that the claimed “mounting means” is not described in the written description of the invention in the specification and, accordingly, is not disclosed in the drawings. Because this portion of claim 1 is written in means-plus-function form, it must be construed to cover the various embodiments disclosed in Appellants’ specification and equivalents thereof (35 USC §112 (6<sup>th</sup> ¶)) and the Examiner’s failure to follow the dictates of the statute is reversible error.

For example, the claimed “mounting means” is disclosed in the specification as providing the functions of “mounting said support frame on a substrate” and “thermal isolation between said substrate and said supporting frame.” (emphasis

added, claim 1). This structure is shown in Figure 3 and discussed in the first paragraph on page 13 of Appellants' specification as filed, and has the resonator element 36 fixably attached to a **supporting frame** ("suspended portion 32"). There is also a **substrate** (40). The claimed "mounting means" comprises legs 43 which are located to mount and thermally isolate the "suspended portion 32" with respect to the "substrate 40" (described on page 13, lines 6 and 7 as maximizing "thermal isolation between the suspended portion 32 and the substrate 40").

Thus, the embodiments of Figure 3, and the embodiments of other figures as discussed in the specification, are covered by the claimed "mounting means" (while drawing objections are not appealable, the Board's proper construction of the "means" claim terms to cover the corresponding structure in the specification will obviate the basis for the drawing objection).

The claimed "mounting means" is clearly shown in Figure 3 as "legs 43" thereby obviating any objection to the drawings because the mounting means is clearly shown in the application as originally filed. This is also discussed on page 6, lines 20-29, further confirming that the mounting means is at least one leg and preferably two or more legs for supporting the suspended portion.

In view of the above, the Examiner's objection to the drawings and the §112 rejection of the claims are both based upon his conclusion that the "mounting means 43" is not illustrated in the drawings or discussed in the specification is simply erroneous and should be reversed by the Board on appeal.

**B. The Examiner fails to properly construe the remaining subject matter of Appellants' claim 1**

In addition to the Examiner's failure to properly construe the "mounting means," the Examiner appears to misunderstand the other elements of the claim. Appellants' claim recites a resonator element 36 which is fixably attached to a supporting frame 32. The device also includes an electrical oscillator for driving the resonator element into resonance and the supporting frame 32 is adapted to absorb infrared radiation, thereby altering a resonant property of the resonator element. As discussed above, the mounting means mounts the supporting frame, not the resonator, on a substrate and provides thermal isolation between the substrate and the supporting frame.

In the paragraph bridging pages 4 and 5 of the Final Rejection, the Examiner cites 60+ year old case law purportedly arguing that "adapted to" is not a positive limitation. The Examiner's attention is directed to the current published US PTO Manual of Patent Examining Procedure (MPEP) §2173.05(g) which specifically indicates how an examiner is to treat Functional Limitations. In the last paragraph of this section, the MPEP repeats court decisions holding that the specific limitation "adapted to" is a limitation which serves "to precisely define present structural attributes of interrelated components of the claimed assembly" and relies upon the more recent decision of *In re Venezia*, 189 USPQ 149 (CCPA 1976).

Accordingly, the claimed structure that “is adapted to” is a positive structural interrelationship that the Examiner must consider as required by both the MPEP and the more recent decisions of the predecessor to the Court of Appeals for the Federal Circuit. The Examiner’s ignoring of the MPEP and its cited decisions (and his failing to properly construe the claims) is reversible error.

### **C. The Examiner fails to understand the Vig reference**

In attempting to read the Vig reference on Appellants’ claimed invention, the Examiner simply fails to identify the elements recited in Appellants’ independent claim 1 or claims dependent thereon. While the Examiner correctly identifies a resonator element 1 in the Vig reference, there is no disclosure that this is “fixably attached to a supporting frame,” especially a frame that itself is supported on a substrate by a mounting structure.

The Examiner suggests that item 2 is the claimed “supporting frame” (the Vig reference clearly teaches that item 2 in Figure 4 is a “thin film support”). The Examiner suggests that this may be disclosed somewhere in the abstract, but there is no discussion of any supporting frame or corresponding structure in the Vig abstract. If the Examiner believes there is any such structure, he is again requested to identify the same.

Assuming for the purpose of argument that the thin film 2 is a “supporting frame” of some sort, the Examiner completely ignores the claim 1 requirement of

a “mounting means” for mounting the supporting frame on a substrate or the requirement that the corresponding structures which comprise the “mounting means” also provide thermal isolation between the substrate and the supporting frame.

Firstly, it is noted that the Examiner does not identify any structure in Figure 4 of Vig which is alleged to be the claimed “mounting means” or any other structure which mounts a supporting frame (thin film 2) on a substrate (40). Does she contend that structures 5 and 6, i.e., “top electrodes 5 and bottom electrodes 6” are the “mounting means” or are they the “substrate”? Does the Examiner also contend that these electrodes somehow also provide thermal isolation between the substrate (electrodes 5 and 6) and the supporting frame (thin film 2)? The Examiner doesn’t indicate what structures correspond to the claimed elements.

The Examiner’s failure to identify structures which she contends falls within the scope of Appellants’ claimed elements is fatal to her interpretation of the Vig reference.

**D. The Examiner errs in failing to identify where all claimed elements are disclosed in Vig or are arranged as in Vig**

In both the anticipation rejection under §102 and the single reference obviousness rejection under §103, the Examiner fails to indicate where all claimed elements and all claimed interrelationships between elements are disclosed in the

Vig reference (required to support an anticipation rejection as well as an obviousness rejection).

As noted above, if the Examiner contends that thin film support 2 is the claimed “supporting frame,” then there is no identified structure anywhere in Vig which comprises Appellants’ claimed “mounting means” (i.e., a structure between the supporting structure and the substrate). If the thin film 2 is the “mounting means,” where is the supporting frame which has the resonator element “fixably attached” thereto (as claimed in claim 1)? Simply put, the Vig reference does not support any rejection of claim 1 under 35 USC §102 or §103 and therefore the Examiner’s rejections thereunder are respectfully traversed.

With reference to the rejection of claim 1 and claims dependent thereon on the basis of anticipation, the Court of Appeals for the Federal Circuit, as noted above in *Lindemannt* "[a]nticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim" (emphasis added). As noted above, the Examiner clearly fails to meet her burden of establishing that all claimed elements and all claimed interrelationships between elements are disclosed in the single Vig reference and therefore the rejection of claim 1 and all claims dependent thereon over the Vig reference is respectfully traversed.

Additionally, the Court of Appeals for the Federal Circuit has also held that “the PTO has the burden under Section 103 to establish a *prima facie* case of

obviousness.” *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). “It can satisfy this burden only by showing some objective teaching in the prior art . . .” None of the references teach the combination of elements of the supporting frame and the substrate with a mounting means therebetween.

As noted above, the Examiner simply fails to meet her burden of establishing a *prima facie* case of anticipation, as well as a *prima facie* case of obviousness over the Vig reference.

**E. The Examiner fails to set forth a *prima facie* case of anticipation under §102 for claims 1-4, 8-14, 16, 17, 19, 20 and 23 or obviousness under §103 for claims 1-4, 8-17 and 19-23 over the Vig reference**

As noted above in subsections A and B, the Examiner has failed to properly construe the “mounting means” structure recited in Appellants’ independent claim 1. If properly construed, Appellants’ claim 1 requires the existence of a mounting means between the substrate and the supporting frame and it is only the supporting frame that mounts the resonator.

As noted above in subsection C, the Examiner fails to understand the Vig reference and there is no disclosure in Vig suggesting that the resonator element is fixably attached to a supporting frame. As noted above in subsection D, the Examiner fails to indicate where the Vig reference teaches Appellants’ claimed “mounting means” or a supporting frame which supports the resonator element.

Because the above missing features are claimed elements and/or claimed interrelationships, the absence of any claimed element obviates any rejection under 35 USC §102 or §103. Because all claimed elements are simply not disclosed or obvious in view of the Vig reference, the Examiner has failed to meet his burden of establishing a *prima facie* case of anticipation or obviousness and any further rejection thereunder is respectfully traversed.

**F. The Examiner fails to set forth a *prima facie* case of obviousness of claim 5 over Vig, McGlade and Biernacki**

As discussed above in section E, the Examiner has failed to demonstrate where elements of claim 1 (from which claim 5 ultimately depends) are in the Vig reference. The Examiner makes no allegation that these missing elements are disclosed in the McGlade or Biernacki reference and they are specifically noted as being missing from these references.

Accordingly, even if all three references were combined, they would not disclose the subject matter of claim 1, let alone claim 5 ultimately dependent thereon. As a result, the Examiner has failed to set forth a *prima facie* case of obviousness of claim 5 under 35 USC §103 and any further rejection thereunder is respectfully traversed.

**G. The Examiner fails to set forth a *prima facie* case of obviousness of claim 6 over Vig and Ishizuya**

As discussed above in section E, the Examiner has failed to demonstrate where elements of claim 1 (from which claim 6 depends) are in the Vig reference. The Examiner makes no allegation that these missing elements are disclosed in the Ishizuya reference and they are specifically noted as being missing from this reference. As a result, even if the two references were combined, they would not disclose the subject matter of claim 1, let alone claim 6 dependent thereon.

Accordingly, the Examiner has failed to set forth a *prima facie* case of obviousness of claim 6 under 35 USC §103 and any further rejection thereunder is respectfully traversed.

**H. The Examiner fails to set forth a *prima facie* case of obviousness of claim 7 over Vig and Paros**

As discussed above in section E, the Examiner has failed to demonstrate where elements of claim 1 (from which claim 7 ultimately depends) are in the Vig reference. The Examiner makes no allegation that these missing elements are disclosed in the Paros reference and they are specifically noted as being missing from this reference. As a result, even if the Vig and Paros references were combined, they would not disclose the subject matter of claim 1, let alone claim 7 dependent thereon.

Accordingly, the Examiner has failed to set forth a *prima facie* case of obviousness of claim 7 under 35 USC §103 and any further rejection thereunder is respectfully traversed.

**I. The Examiner fails to set forth a *prima facie* case of obviousness of claim 18 over Vig and McGlade**

As discussed above in section E, the Examiner has failed to demonstrate where elements of claim 1 (from which claim 18 ultimately depends) are in the Vig reference. The Examiner makes no allegation that these missing elements are disclosed in the McGlade reference and they are specifically noted as being missing from this reference. As a result, even if the two references were combined, they would not disclose the subject matter of claim 1, let alone claim 18 ultimately dependent thereon.

Accordingly, the Examiner has failed to set forth a *prima facie* case of obviousness of claim 18 under 35 USC §103 and any further rejection thereunder is respectfully traversed.

**VIII. CONCLUSION**

The error in the Examiner's failure to adhere to the claim construction requirements of paragraph six of 35 USC §112 and the failure to properly construe "means plus function" claims as well is apparent. The failure to identify claimed elements, especially when challenged, is an admission that the rejection is

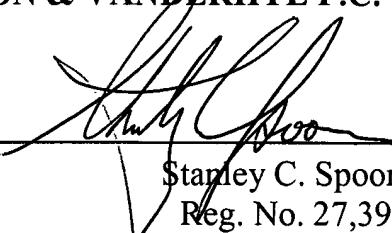
unsupported. The Examiner does not identify any prior art structures that she believes corresponds to the claimed elements such as the “resonator” on a “support frame” or a “mounting means” supporting and thermally located “between said substrate and said support frame” and thus the failure to identify is a failure to establish a *prima facie* case of anticipation and/or obviousness and is reversible error.

As a result of the above, there is simply no support for the rejections of Appellants' independent claim or claims dependent thereon under 35 USC §112, §102 or §103. Thus, and in view of the above, the rejection of claims 1-23 under 35 USC §§112, 102 and 103 is clearly in error and reversal thereof by this Honorable Board is respectfully requested.

Respectfully submitted,

**NIXON & VANDERHYE P.C.**

By:



Stanley C. Spooner  
Reg. No. 27,393

SCS:kmm  
Enclosure

## **IX. CLAIMS APPENDIX**

1. A device for detecting infrared radiation comprising:
  - a resonator element fixably attached to a supporting frame;
  - an electrical oscillator for driving said resonator element into resonance,wherein the supporting frame is adapted to absorb infrared radiation received by the device thereby altering a resonant property of said resonator element; and mounting means for mounting said supporting frame on a substrate and for providing thermal isolation between said substrate and said supporting frame.
2. A device according to claim 1 wherein the supporting frame comprises a suspended portion spaced apart from the underlying substrate of the device, the resonator element being fixably attached to the suspended portion.
3. A device according to claim 2 wherein the suspended portion is spaced apart from the underlying substrate by a distance that is sufficient to form a resonant absorption structure for radiation having a wavelength within the infrared detection band of the device.
4. A device according to claim 2 wherein the suspended portion is suspended from the underlying substrate on at least one leg.

5. A device according to claim 4 wherein the at least one leg comprises conductive material arranged to provide an electrical connection between the suspended portion and the underlying substrate.
6. A device according to claim 1 wherein the supporting frame comprises a layer of infrared absorbent material.
7. A device according to claim 1 wherein the resonator element and the supporting frame have different coefficients of thermal expansion.
8. A device according to claim 1 wherein a resonant frequency of the resonator element is arranged to vary when infrared radiation is absorbed by the device.
9. A device according to claim 1 and further comprising oscillation means to drive the resonator element into resonance.
10. A device according to claim 9 wherein the oscillation means is arranged to electrostatically drive the resonator element.

11. A device according to claim 1 wherein the resonator element is fixably attached to the supporting frame at two or more points.

12. A device according to claim 1 wherein the resonator element comprises an elongate flexible beam.

13. A device according to claim 1 wherein the supporting frame comprises a layer of material having an aperture defined therein.

14. A device according to claim 13 wherein the resonator element comprises an elongate flexible beam, said elongate flexible beam being arranged to lie across the aperture defined in the layer of material.

15. A device according to claim 1 wherein at least one of the supporting frame and resonator element comprise a shape memory alloy.

16. A device according to claim 1 comprising a plurality of detection elements, each detection element comprising a resonator element fixably attached to a supporting frame.

17. A device according to claim 16 wherein each detection element has an axis of symmetry.

18. A detector according to claim 16 wherein each detection element is arranged to output an electrical signal that is indicative of the resonant frequency of the associated resonator element.

19. A detector according to claim 16 wherein an array of detection elements is provided.

20. A device according to claim 1 that is formed using a micro-fabrication process.

21. A device according to claim 1 and further comprising readout electronics.

22. A device according to claim 21 wherein the supporting frame and resonator element are vertically integrated with the readout electronics.

23. A thermal imaging camera incorporating a device according to claim 1.

**X. EVIDENCE APPENDIX**

None.

**XI. RELATED PROCEEDINGS APPENDIX**

None.